4 DEMAND ESTIMATION METHODOLOGY AND RIDERSHIP FORECASTS BY ALTERNATIVE

This chapter presents ridership forecasts for each of the six alternatives, for the year 2020. The forecasting methodologies are described briefly below and in detail in Appendix 3.

Ridership forecasts were developed for both visitors and residents. For residents, demand was forecast in terms of home-based work trips (trips between home and work, in either direction), home-based other trips (all other trips with one end at home), and non-home-based trips (trips where neither end is at home). Resident forecasts were developed using quick-response travel estimation techniques described in the National Cooperative Highway Research Program's (NCHRP) reports 187 and 365.[4] The overall method is a simplified version of traditional four-step transportation modeling, which includes trip generation, trip distribution, mode-split, and traffic assignment, and uses transferable model parameters from other small urban areas in cases where specific data was not available for the Bangor to Bar Harbor corridor. These methods are detailed in Appendix 3.

Visitor forecasts were developed using stated and revealed preference methodologies that utilized the results of surveys conducted for this study. Visitor travel was forecast in terms of "mode-shift" and "induced demand." Mode shift refers to those who already make trips to, from, or within the Bangor to Bar Harbor corridor,[5] but who would shift from their existing mode, or method of travel, and use Bangor to Bar Harbor transit service instead. Induced demand refers to new trips that would be made because the transit services would make the area a more attractive destination. These new trips could be additional trips made by current area visitors, and completely new trips made by those who would not otherwise visit Maine.

4.1 Summary of Ridership Forecasts

In the summer of 2020, peak daily demand for Bangor to Bar Harbor transit services would range from 1,116 to 1,609 trips per day (see following table). The highest ridership alternative would be Alternative 4/LRT A, which is the "fast light rail" alternative. This alternative would provide among the fastest service, and survey respondents indicated a preference for light rail over the bus alternatives. The lowest ridership alternative would be Alternative 6/Ferry Alternative. While this alternative would appeal to visitors, the long travel time and lack of intermediate stops would discourage nearly all residents from using the service.

[4] NCHRP Report 187, "Quick-Response Urban Travel Estimation Techniques and Transferable Parameters," Transportation Research Board, 1978, and NCHRP Report 365, "Travel Estimation Techniques for Urban Planning," Transportation Research Board, 1998.

[5] For the purposes of this study, these persons were defined as those who had visited Maine one or more times in the past three years.

Table 9: 2020 Peak Month Daily Ridership by Alternative and Type of Trip

	Resident Trips	Visitor Trips				Total All Trips
		Mode Shift	Induced Demand Add'l Trips	Induced Demand New Trips	Total Visitor	
Alt 1 Rail/Bus	540	624	62	103	789	1,329
Alt 2 Bus	546	675	68	111	854	1,400
Alt 3 Busway Bypass	588	725	72	120	917	1,505
Alt 4 LRT A	533	851	85	140	1,076	1,609
Alt 5 LRT B	546	806	80	133	1,019	1,565
Alt 6 Ferry	5	879	87	145	1,111	1,116

As shown in the table on the next page, ridership levels would be highest in the peak visitor months of July and August. For the land-based alternatives, ridership levels in June and September would be about 80% of July and August levels.

Visitor Ridership

For all alternatives, summertime visitors to Bar Harbor represent the largest group of potential users of the proposed new transportation services. For the land-based alternatives, visitor ridership would comprise 55% to 65% of total trips. The large majority of visitor trips—80%—would be made by those who already visit Maine, and would use Bangor to Bar Harbor services if they were available. The remaining visitor trips would consist of new trips that would not otherwise be made if Bangor to Bar Harbor transit services were not available. Approximately one-third of these trips would be additional trips made by those who already visit Maine, and two-thirds would be made by those who have not visited Maine in the past three years.

Table 10: 2020 Average Daily Ridership, by Alternative and Month[6]

	Alt 1 Rail/Bus	Alt 2 Bus	Alt 3 Busway Bypass	Alt 4 LRT A	Alt 5 LRT B	Alt 6 Ferry
January	530	539	581	544	551	83
February	539	550	592	557	563	96
March	553	565	608	576	581	116
April	627	645	694	677	677	220
May	781	811	873	886	875	436
June	1,102	1,154	1,241	1,299	1,271	796
July	1,327	1,397	1,502	1,605	1,561	1,112
August	1,329	1,400	1,505	1,609	1,565	1,116
September	1,038	1,089	1,171	1,236	1,207	798
October	845	880	947	973	957	526
November	529	539	580	543	550	82
December	510	518	558	516	525	55

[6] For demand forecasting purposes, we tested 12-month ridership although the service is envisioned to be operated June 1-October 15. Off-season ridership is excluded from subsequent tables.

As with total trips, Alternative 4/LRT A would attract the highest number of visitor trips, followed by Alternative 6/Ferry. Somewhat surprisingly, respondents to both the Visitor Induced Demand and Mode Shift surveys responded relatively positively to the ferry alternative in spite of the long (approximately 2.5 hour) travel time. This is the case presumably because the ferry trip would be considered as an attraction as well as transportation.

Alternative 1/Rail-Bus would attract the lowest number of visitors, largely because it would be the most inconvenient, requiring two transfers, and one of the slowest trip times. Visitor ridership on the two bus alternatives is projected to be lower than on the light rail alternatives, even though these options would provide one-seat service and the fastest service. These lower projections reflect visitor preferences for rail service, as expressed in the two surveys. Over time, ridership on bus alternatives could be closer to that of light rail as repeat visitors become more familiar with bus service. However, considering that most visitors are first time or infrequent visitors, preconceived notions regarding differences between bus and light rail will likely continue to be as or more important than actual differences.

Resident Ridership

While visitor ridership would be lower on the bus alternatives, it is projected that resident ridership would be highest on Alternative 3/Busway Bypass, and in the same range for Alternative 2/Bus. This is because regular riders would be more concerned with one-seat service and faster travel times than visitors. Also, Alternative 1/Rail-Bus, which would carry the lowest number of visitors, would carry among the highest number of resident riders. However, all in all, there would be only very small differences in ridership on the land-based alternatives. This would be because most resident ridership would be concentrated at the ends of the corridor and most trips would be made on the Bangor to Brewer and Ellsworth to Bar Harbor segments of the bus services. There would be relatively little "end-to-end" resident ridership, and as a result, the inconvenience of a transfer at Brewer, Ellsworth, or BHB Intermodal Facility would affect only a small number of resident riders.

Alternative 6/Ferry would carry only a negligible number of resident riders because there is little resident demand for end-to-end service, and travel times would be very long. The Bangor to Brewer and Ellsworth to Bar Harbor trips that would make up the bulk of resident ridership on the other alternatives would not be served by Bangor to Bar Harbor ferry service, and the long travel times would discourage the few that would make end-to-end trips on the other alternatives.

Resident ridership on all the land-based alternatives would be higher by about 340 trips if there were a light rail shuttle connecting Bangor and Orono.

Major Markets for Bangor to Bar Harbor Service

The major market for Bangor to Bar Harbor services would be visitors, who would comprise 55%-65% of all riders on the land-based alternatives, and nearly all of the riders for the ferry alternative. Most of the visitors who would use Bangor to Bar Harbor services would be those who would travel to the area by a means other than by automobile—plane, bus, or boat. As shown in the table below, of the visitors who currently travel to the corridor by these other modes, up to 11% would use Bangor to Bar Harbor corridor transit services. Of those who currently travel to the area by automobile, only 1.9 to 4.3% would use corridor transit services.

Survey responses indicated that once visitors have decided to drive to the Mount Desert Island area, relatively few would use Bangor to Bar Harbor services instead of their own vehicle.

Table 11: Percent of Current Visitors Who Would Use Bangor to Bar Harbor Transit Service

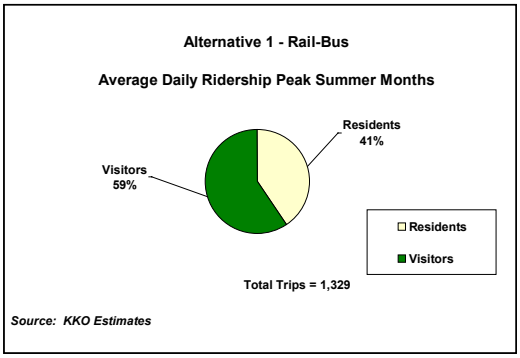
Current Access Mode	Percent of Current Visitors	Projected Mode Share					
		Alt 1 Rail/Bus	Alt 2 Bus	Alt 3 Busway Bypass	Alt 4 LRT A	Alt 5 LRT B	Alt 6 Ferry
Drive w/o Trailer	68.5%	3.0%	3.4%	3.7%	4.3%	4.1%	3.5%
Drive RV or w/trailer[7]	10.0%	1.9%	2.2%	2.4%	2.9%	2.7%	1.4%
Fly to Bangor	2.8%	4.4%	4.9%	5.2%	6.1%	5.8%	11.3%
Fly to Other Airport	16.4%	4.7%	5.2%	5.6%	6.4%	6.1%	8.4%

4.2 Projected Ridership by Alternative

Among the studied alternatives, projected ridership ranges from 1,116 to 1,609 total trips per peak summer day in 2020. As described below, these differences in ridership levels are primarily the result of differences in travel times, the number of connections, and for some alternatives, visitor preferences for rail over bus.

Alternative 1/Rail-Bus

As described in Chapter 2, Alternative 1 would consist of bus service between Bangor (with a stop at the Bangor Waterfront) and Brewer, rail service between Brewer and Ellsworth, and bus service between Ellsworth, Trenton, and Bar Harbor. During the peak months of July and August, Alternative 1 would carry approximately 1,330 riders per day, approximately 59% of whom would be visitors, and 41% of whom would be residents (see table below). This alternative would attract the fewest number of visitor trips, primarily because the need to transfer twice between Bangor and Bar Harbor would make service more inconvenient than the other alternatives.



[7] Most of these visitors would still drive to the Bar Harbor area but would use corridor services for local travel and side trips.

Table 12: Alternative 1/Rail-Bus: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	540	445	44	73	1,102
July	540	622	62	103	1,327
August	540	624	62	103	1,329
September	474	446	44	73	1,038
October 1-15	237	147	15	24	422

Resident trips, however, would be concentrated along the two ends of the corridor, either between Brewer and Bangor, or between Ellsworth and Bar Harbor (see table on next page). Because of this, most resident trips would be made exclusively on the connecting bus services, and as a result, these trips would not be affected by the Brewer and Ellsworth transfers to the same degree as visitor trips. Furthermore, compared to Alternatives 4 and 5, which would consist of light rail service from Bangor to Trenton, and then connecting bus service to Bar Harbor, Alternative 1 would attract slightly more ridership between the coastal communities. This would be because travel to and from Ellsworth would not require a transfer at BHB Intermodal Facility. Because of these factors, resident ridership would not be significantly different for Alternative 1 than for the other alternatives.

Table 13: Alternative 1 (Rail/Bus) 2020 Average Daily Ridership by Station (August)

From	To: Bangor (BGR & Waterfront)	Brewer Station	Ellsworth Station	BHB Intermodal Station	Bar Harbor Station	Total
Visitor Trips						
Bangor Stations		0	0	42	192	233
Brewer Station	0		0	6	74	80
Ellsworth Station	0	0		14	68	82
BHB Station	42	6	14		0	61
Bar Harbor Station	192	74	68	0		334
Total	**233**	**80**	**82**	**61**	**334**	**789**
Resident Trips						
Bangor Stations		121	19	5	8	154
Brewer Station	121		16	2	1	140
Ellsworth Station	19	16		18	57	109
BHB Station	5	2	18		22	47
Bar Harbor Station	8	1	57	22		89
Total	**154**	**140**	**109**	**47**	**89**	**540**
Total Trips						
Bangor Stations		121	19	47	200	388
Brewer Station	121		16	7	76	220
Ellsworth Station	19	16		32	125	191
BHB Station	47	7	32		22	108
Bar Harbor Station	200	76	125	22		422
Total	**388**	**220**	**191**	**108**	**422**	**1,329**

As can be seen from this table, the highest visitor trip pair is between Bangor and Bar Harbor, while the highest resident trip pair is between Bangor and Brewer.

Alternative 2/Bus

Alternative 2, which would consist of bus service operating over regular roads between Bangor and Bar Harbor with intermediate stops at the Bangor Waterfront and in Brewer, Ellsworth, and Trenton, would attract about 1,400 riders per day during the peak months of July and August (see table below). Although visitors would represent 61% of the riders, this alternative attracts comparatively few visitors. The two bus alternatives (this alternative and Alternative 3/Busway Bypass) would be the only alternatives to provide one-seat service between Bangor and Bar Harbor, and in this respect, would provide superior service compared to the other alternatives. However, in the surveys, visitors indicated a preference for light rail service, even if the light rail service involved a transfer at BHB Intermodal Facility. While the actual differences between bus and light rail service may not be as significant as perceived by visitors, most visitor travel decisions would be made before leaving home. As a result, these perceptions would likely impact bus ridership levels, and the projection of 854 visitor trips per summer day reflects those visitor perceptions and preferences.

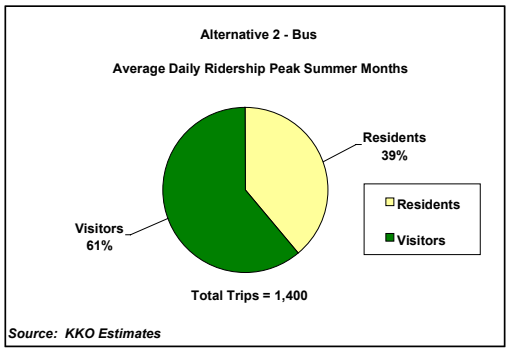


Table 14: Alternative 2/ Bus: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	546	481	48	79	1,154
July	546	673	67	111	1,397
August	546	675	68	111	1,400
September	479	483	48	80	1,089
October 1-15	239	159	16	26	400

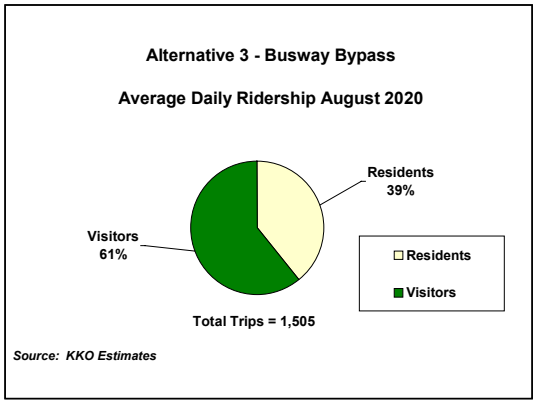
Resident ridership, however, would be higher on this alternative than on most others because residents are more sensitive to transfers than visitors. Without the Trenton transfer, the bus alternative would provide shorter travel times and require fewer transfers for some trips than the other alternatives. However, as noted above, because relatively few trips are made from one end of the corridor to the other, the ridership benefits of the no transfer service are small.

Ridership patterns for Alternative 2 would be similar to those for Alternative 1 and all other alternatives. Visitor ridership would be dominated by trips made from end-to-end, and resident trips would be concentrated along the two ends of the corridor (see table on the next page).

Table 15: Alternative 2/Bus 2020 Average Daily Ridership by Station (August)

From	To: Bangor (BGR & Waterfront)	Brewer Station	Ellsworth Station	BHB Intermodal Station	Bar Harbor Station	Total
Visitor Trips						
Bangor Stations		0	0	22	299	321
Brewer Station	0		0	1	16	17
Ellsworth Station	0	0		6	82	89
BHB Station	22	1	6		0	30
Bar Harbor Station	299	16	82	0		397
Total	**321**	**17**	**89**	**30**	**397**	**854**
Resident Trips						
Bangor Stations		121	21	6	9	162
Brewer Station	121		18	2	2	143
Ellsworth Station	21	18		17	55	111
BHB Station	6	2	17		22	47
Bar Harbor Station	9	2	55	22		88
Total	**157**	**143**	**111**	**47**	**88**	**546**
Total Trips						
Bangor Stations		121	21	28	308	478
Brewer Station	121		18	3	18	160
Ellsworth Station	24	18		23	137	200
BHB Station	28	3	23		22	76
Bar Harbor Station	308	18	137	22		485
Total	**478**	**160**	**200**	**76**	**485**	**1,400**

Alternative 3/Busway Bypass



Alternative 3, bus service between Bangor and Bar Harbor, operating for most of the distance between Brewer and Trenton in a dedicated busway, with stations in Bangor, Brewer, Ellsworth, Trenton, and Bar Harbor, would attract the highest number of weekday resident trips, and the third highest number of total trips. Total peak summer average daily ridership in 2020 would be approximately 1,500, of which 39% would be resident trips and 61% would be visitor trips (see table on next page).

This alternative attracts more visitors than Alternative 2/Bus, likely because of its shorter travel time. However, the ridership potential of this alternative would also be affected by the preference for light rail indicated by visitors through the survey. Residents would be attracted to this alternative for the reasons cited earlier for Alternative 2: shorter travel times and fewer transfers.

Table 16: Alternative 3/ Busway Bypass: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	588	517	51	85	1,241
July	588	723	72	119	1,502
August	588	725	72	120	1,505
September	516	518	52	85	1,171
October 1-15	258	170	17	28	473

Ridership patterns would be similar to those for Alternative 2, but with higher volumes at all stations, as indicated in the following table.

Table 17: Alternative 3/Busway Bypass 2020 Average Daily Ridership by Station (August)

	To					
From	Bangor (BGR & Waterfront)	Brewer Station	Ellsworth Station	BHB Intermodal Station	Bar Harbor Station	Total
Visitor Trips						
Bangor Stations		0	0	24	321	345
Brewer Station	0		0	1	17	19
Ellsworth Station	0	0		7	89	95
BHB Station	24	1	7		0	32
Bar Harbor Station	321	17	89	0		427
Total	**345**	**19**	**95**	**32**	**427**	**917**
Resident Trips						
Bangor Stations		121	24	7	10	162
Brewer Station	121		21	2	2	146
Ellsworth Station	24	21		21	63	129
BHB Station	7	2	21		22	53
Bar Harbor Station	10	2	63	22		97
Total	**162**	**146**	**129**	**53**	**97**	**588**
Total Trips						
Bangor Stations		121	24	31	331	507
Brewer Station	121		21	4	19	165
Ellsworth Station	24	21		28	152	225
BHB Station	31	4	28		22	85
Bar Harbor Station	331	19	152	22		524
Total	507	165	225	85	524	1,505

Alternative 4/LRT A

Alternative 4 would consist of light rail service operating between Bangor and Trenton, with intermediate stations at the Bangor Waterfront, Brewer, and Ellsworth. Bus service would be provided from Trenton to Bar Harbor and other Mount Desert Island destinations. This alternative would also include right-of-way improvements to straighten curves to allow higher maximum speeds. This alternative would attract the highest number of riders of any alternative, at 1,609 total trips per peak summer weekday in 2020 (see table below). Visitors would represent 67% of the riders, while residents would account for 33%.

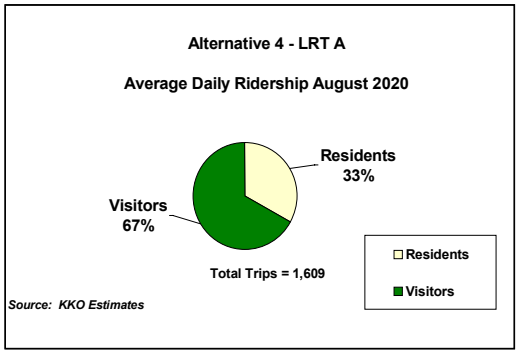


Table 18: Alternative 4/LRT A: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	533	606	60	100	1,299
July	533	848	84	140	1,605
August	533	851	85	140	1,609
September	467	608	61	100	1,236
October 1-15	234	200	20	33	486

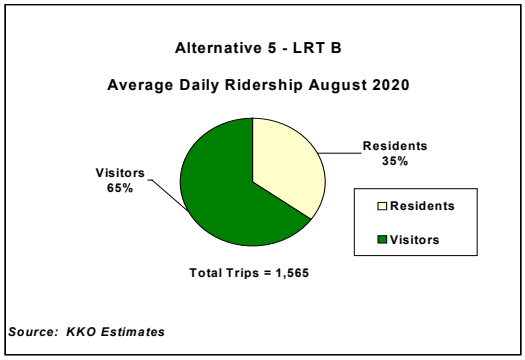
Alternative 4 would attract the highest level of total ridership because it would attract the highest level of visitor ridership, at 1,076 trips per peak summer day. As described earlier, the higher ridership projections for light rail are in response to visitors' stated preference for light rail service, even though most trips would require a transfer at BHB Intermodal Facility.

Summertime (July and August) ridership patterns for Alternative 4 would include more than 500 trips per day between Bangor and Bar Harbor, and about 200 trips between Bangor and Brewer (see following table).

Table 19: Alternative 4/LRT A 2020 Average Daily Ridership by Station (August)

From	To: Bangor (BGR & Waterfront)	Brewer Station	Ellsworth Station	BHB Intermodal Station	Bar Harbor Station	Total
Visitor Trips						
Bangor Stations		0	0	57	259	316
Brewer Station	0		0	8	102	110
Ellsworth Station	0	0		19	94	113
BHB Station	57	8	19		0	84
Bar Harbor Station	259	102	94	0		455
Total	**316**	**110**	**113**	**84**	**455**	**1,076**
Resident Trips						
Bangor Stations		105	24	7	9	291
Brewer Station	105		21	2	2	149
Ellsworth Station	24	21			55	123
BHB Station	7	2	2		21	51
Bar Harbor Station	9	2	2	21		89
Total	**145**	**130**	**120**	**51**	**88**	**533**
Total Trips						
Bangor Stations		105	24	64	268	607
Brewer Station	105		21	10	104	259
Ellsworth Station	24	21		39	149	235
BHB Station	64	10	39		21	135
Bar Harbor Station	268	104	149	21		543
Total	**460**	**239**	**233**	**134**	**542**	**1,609**

Alternative 5/LRT B



Alternative 5 would consist of light rail service operating between Bangor and Trenton, in a similar manner as Alternative 4, but with slower operating speeds and thus longer travel times (86 minutes between Bangor and Bar Harbor, versus 74 minutes for Alternative 4). Total ridership on this alternative would be 1,565 trips per summer weekday in 2020, which would be the second highest level of the six alternatives. The ridership would be 65% visitors and 35% residents (see table below).

Table 20: Alternative 5/LRT B: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	546	574	57	95	1,271
July	546	803	80	132	1,561
August	546	806	80	133	1,565
September	479	576	57	95	1,207
October 1-15	239	189	19	31	479

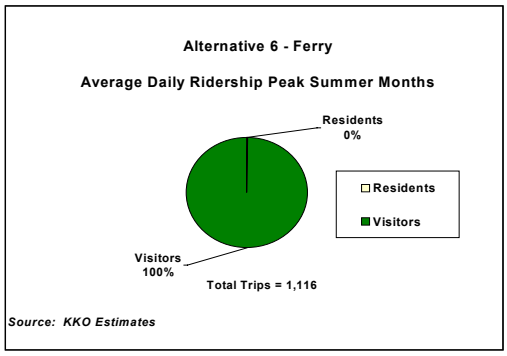
Visitor ridership patterns would be similar to, but slightly lower than, those of Alternative 4, reflecting longer travel times (see following table).

Table 21: Alternative 5/LRT B 2020 Average Daily Ridership by Station (August)

From	To: Bangor (BGR & Waterfront)	Brewer Station	Ellsworth Station	BHB Intermodal Station	Bar Harbor Station	Total
Visitor Trips						
Bangor Stations		0	0	54	245	299
Brewer Station	0		0	7	96	104
Ellsworth Station	0	0		18	89	106
BHB Station	54	7	18		0	79
Bar Harbor Station	245	96	89	0		431
Total	**299**	**104**	**106**	**79**	**431**	**1,019**
Resident Trips						
Bangor Stations		121	20	6	8	155
Brewer Station	121		17	2	1	142
Ellsworth Station	20	17		20	54	111
BHB Station	6	2	20		23	51
Bar Harbor Station	8	1	54	23		87
Total	**155**	**142**	**111**	**51**	**87**	**546**
Total Trips						
Bangor Stations		121	20	60	254	455
Brewer Station	121		17	9	98	245
Ellsworth Station	20	17		38	143	218
BHB Station	60	9	38		23	130
Bar Harbor Station	254	98	143	23		517
Total	**455**	**245**	**218**	**130**	**517**	**1,565**

Alternative 6/Ferry

Alternative 6 would consist of ferry service operating between the Bangor waterfront and Bar Harbor. There would be bus connections between BGR and the ferry terminal, as well as a connection to the Island Explorer. Travel times associated with ferry service would be very high, at approximately 2.5 hours between Bangor and Bar Harbor.



Somewhat surprisingly, respondents to both the on-site and mail-back surveys responded relatively positively to the ferry alternative, in spite of the long travel time. This is the case presumably because the ferry trip would be considered as an attraction as well as transportation. However, with these very long travel times, and the lack of service to intermediate locations such as Brewer and Ellsworth, few resident trips would be attracted.

In total, projected peak summer day ridership in 2020 would be 1,116 trips per day, virtually all of which would be visitor ridership (see table below). This level of visitor ridership would be the second highest, and only slightly lower than for Alternative 4/LRT A.

Table 22: Alternative 6/Ferry: Average Daily Ridership by Trip Type and Month

	Resident	Visitor Mode Shift	Current Visitor Add'l Trips	Trips by New Visitors	Total
June	5	626	62	103	796
July	5	876	87	144	1,112
August	5	879	87	145	1,116
September	4	628	63	103	798
October 1-15	0	41	4	7	53

4.3 Sensitivity Of Ridership Forecasts To Market And Service Changes

All of the ridership forecasts were based on 2020 market size projections and the following service assumptions:

- $5.00 end-to-end transit fare, with correspondingly lower intermediate fares (generally $1.00 between Bangor and Brewer, $3.00 between Brewer and Ellsworth, and $1.00 between Ellsworth and Trenton).
- 6 round trips per day: 3 in the morning and 3 in the afternoon/early evening.
- Travel times as defined in Chapter 2.

With changes in market size, or market or service characteristics, projected ridership would be higher or lower—for example, increases in market size, lower fares, shorter travel times, and

more service would attract more riders. Conversely, decreases in market size, higher fares, longer travel times, and less service would attract fewer riders. The following factors would significantly affect ridership levels:

- The availability of other transit services
- Changes in overall market size
- Fare levels
- Service frequency
- Transit travel times
- Traffic congestion
- Changes in market characteristics

Availability of Other Transit Services

The attractiveness of Bangor to Bar Harbor transit services would also be related to the availability of other services. As described above, visitors who were aware of the Island Explorer were much more likely to use Bangor to Bar Harbor services than those who were not. Similarly, the development of the other transit services envisioned in Maine's Strategic Passenger Transportation Plan would increase the attractiveness of Bangor to Bar Harbor service. As shown in the table below, with the availability of the other Strategic Plan services in order to make connections to and from other parts of Maine, Bangor to Bar Harbor transit ridership would be 23% to 44% higher, depending on which alternative is implemented and the marketing of all of the services to the visitor community. The impact on the resident portion of the market was not tested.

Table 23: Impact of Availability of Maine Strategic Passenger Transportation Plan Services (Average Daily Visitor Mode Shift Trips, Peak Summer Day, 2020)

	Alt 1 Rail/Bus	Alt 2 Bus	Alt 3 Busway Bypass	Alt 4 LRT A	Alt 5 LRT B	Alt 6 Ferry
Visitor Trips Without Other Services	624	675	725	851	806	879
Visitor Trips With Other Services	795	873	927	1,044	995	1,267
Percent Increase in Visitor Trips	27%	29%	28%	23%	23%	44%

Overall Market Size

The visitor ridership projections are based on peak summer travel volumes of 19,000 daily one-way trips to and from Bar Harbor in 2020 as described in Chapter 3. This represents an increase of 18% over current levels of 16,000 per day. These estimates were developed based on:

- U.S. population growth projections.
- Growth in domestic travel in the US over the past six years relative to population growth.
- Projections of future travel growth prepared by the Travel Industry Association of America.
- An assessment of a variety of trends which are likely to impact levels of travel activity and the types of trips taken, and the relative positioning of Maine and/or the Northeast relative to national and international trends.

However, projections of visitor travel beyond a two to three year time horizon are very speculative given the wide variety of unpredictable and subjective factors that impact travel activity. If travel preferences or conditions change such that Bar Harbor is more or less popular as a destination, the ridership on the proposed services would rise of fall proportionally. Thus, a ten percent increase in daily visitor trips (from 19,000 to 20,900) would lead to a ten percent increase in daily visitor ridership of each the six alternatives.

Projections of resident travel are based on projections of population and employment growth. The Bangor to Bar Harbor corridor is relatively stable in terms of population change, with small declines being experienced in Bangor, and small increases being experienced elsewhere. Overall, the ridership forecasts are based on total population growth in the corridor of 0.9% per year, and current per-capita employment rates. Given these low rates of growth, the resident forecasts are less speculative than visitor market projections, but changes in population and employment levels would still impact future resident travel levels.

Fare Levels

All travelers are sensitive to fare levels, but in the case of Bangor to Bar Harbor service, residents would be much more sensitive to different fare levels than visitors. This would be because, for visitors, the cost of Bangor to Bar Harbor service would represent only a small portion of total travel costs. As shown in the table on the next page, for Alternative 4/LRT A, which is the highest ridership alternative, a $10 fare would attract only 10% fewer visitor riders, but 25% fewer resident riders.

Table 24: Fare Sensitivity: Alternative 4/LRT A

	Fare Level		
	$5.00 [Baseline]	$10.00	$2.50
2020 Weekday Visitor Ridership	851	770	894
% Change		-10%	+5%
2020 Weekday Resident Ridership	533	401	626
% Change		-25%	+18%
Total 2020 Weekday Ridership	1,384	1,171	1,520

Service Frequency

Transit ridership levels are particularly sensitive to service frequency. For resident riders, this is especially true when service levels are low, and when a transit service operates in middle and upper income areas. Off-peak riders are also normally more sensitive to frequency changes than peak period riders.[8] These factors indicate that resident ridership on Bangor to Bar Harbor transit services would exhibit greater sensitivity to frequency differences than most services, and the methodology used in these forecasts is based on observed impacts in other areas in which a 1% change in service levels would result in an approximate 0.75% change in ridership. On this basis, for Alternative 4/LRT A, a doubling of service levels would increase ridership by 58%. Service every 30 minutes would increase resident ridership by 164%.

Table 25: Level of Service Sensitivity: Alternative 4/LRT A

	Level of Service		
	6 Round Trips	12 Round Trips (every 60 mins)	24 Round Trips (every 30 mins)
2020 Weekday Visitor Ridership	851	1,144	1,311
% Change		+34%	+53%
2020 Weekday Resident Ridership	533	843	1,406
% Change		+58%	+164%
Total 2020 Weekday Ridership	1,384	1,987	2,717

The on-site surveys showed visitors to also be very sensitive to differences in service levels, although to a lesser degree than resident riders. Service every 60 minutes would attract 34% more visitor trips than only 6 round trips per day, and service every 30 minutes would increase visitor ridership by 54%.

[8]TCRP "Traveler Response to Transportation Changes," Interim Handbook, March 2000.

Transit Travel Times

Travel times consist of both in-vehicle (time spent in a vehicle) and out-of-vehicle (transfer, wait, and access) travel times, and travelers consider out-of-vehicle times to be significantly more onerous than in-vehicle times. For most automobile trips, out-of-vehicle times are short, and consist of the time it takes for travelers to walk to and from their cars. For transit trips, out-of-vehicle times are generally longer, and consist of the time required to walk to and from stations, wait times at stations, and transfer times.

Both visitor and resident responses to travel time differences can be seen in the projections for Alternatives 2/Bus and 3/Busway Bypass, which differ largely in travel time. The 15 minute travel time savings afforded by Alternative 3 (65 minutes versus 80 minutes, or a savings of 19%)[9] would increase visitor ridership by 7% and resident ridership by 4%.

Traffic Congestion

For the alternatives in which service would operate completely or partially in exclusive rights-of-ways (Alternatives 1/Rail-Bus, 3/Busway Bypass, 4/LRT A, and 5/LRT B) increases in traffic congestion in the corridor would increase the competitiveness of the transit services operating in exclusive right-of-ways. (Connecting and local bus services operating on local streets would be subject to the same traffic delays, and there would not be any relative changes.)

Somewhat surprisingly, current area visitors indicated that increasing levels of congestion would not make them more likely to use Bangor to Bar Harbor transit services, and as a result, no additional ridership would be expected with moderate increases in travel times as a result of increased traffic congestion. Part of this response may be due to the perception among current visitors that traffic congestion is not a significant problem, with only 11 percent of survey respondents "strongly agreeing" that "Traffic congestion in Maine is a big problem," and only 14% "agreeing." Still, as stated above, those that strongly agree that traffic is a big problem would be no more likely to use Bangor to Bar Harbor service than those who don't.

Residents, on the other hand, would be sensitive to increases in traffic congestion. For Alternative 4/LRT A, a 10% increase in automobile and connecting bus travel times, but no increase in light rail travel times, would increase resident transit ridership by 7% (see Table 18). A 25% increase in automobile travel times would increase resident transit ridership by 27%.

[9] Including 5 minutes for the transfer at Trenton.

Table 26: Sensitivity to Increased Levels of Traffic Congestion: Alternative 4/LRT A

	Increase in Travel Times		
	0%	10%	25%
2020 Weekday Visitor Ridership	851	851	851
% Change		0%	0%
2020 Weekday Resident Ridership	533	590	678
% Change		7%	27%
Total 2020 Weekday Ridership	1,384	1,441	1,529

Changes in Market Characteristics

Characteristics of the existing visitor market impact projected ridership levels, and the 2020 visitor market projections assume that overall visitor characteristics will be similar to those of the current market. As noted above, visitors who fly to Bangor are much more likely to shift to Bangor to Bar Harbor transit services than those who drive. Additional visitor characteristics that particularly impact projected ridership levels are:

- **Knowledge of Island Explorer Bus Service:** Visitors who know about the Island Explorer bus service are more likely to use Bangor to Bar Harbor transit services. A 10% increase in the percentage of visitors who are aware of Island Explorer service (from 51% to 56%) would increase ridership levels by 3%.
- **Age:** As the oldest person in a group of visitors goes up, the group's willingness to use a rail or bus alternative goes down. For example, the current average age of the oldest person in groups visiting Bar Harbor is 49. When the average age increases to 55, the propensity to use Bangor to Bar Harbor service decreases by nearly 4%.
- **Length of Stay: Visitors** willingness to use Bangor to Harbor services increases with length of stay. For example, visitors who stay 5 days would make 6.6% more trips on Bangor to Bar Harbor transit services than visitors who stay 4 days.

A summary of factors that significantly impact ridership is shown in the table on the next page, in terms of how a 10% increase in visitation levels in certain market segments, or other market characteristics, would affect overall Bangor to Bar Harbor transit ridership.[10]

[10] As an example, in the first row, the table indicates that a 10% increase in the number of visitors from Maine would result in a 2.9% decrease in ferry ridership. This would be because visitors from Maine would be less likely to use the ferry alternatives than visitors from out of state.

Table 27: Impact of a 10% Increase in Visitation Levels on Bangor to Bar Harbor Transit Ridership by Market Segment

Visitor Characteristic	Current Level/Value	Impact on Ridership	
		Land-Based Alternatives (Alt 1 to 5)	Ferry (Alt 6)
Residence			
From Maine	15.2%	--	-2.9%
From Canada	3.2%	-0.1%	--
From Other Foreign Country	3.0%	--	-1.9%
Trip Purpose			
Visit friends & family	6.4%	+0.4%	+5.2%
Business	2.4%	--	+6.3%
Group Composition			
Alone or in couple	37.2%	--	3.17
Average age of oldest	49 years	-3.8%	--
Average age of youngest	27 years	-0.6%	--
Length of Stay			
Average days on Bar Harbor	3.8	1.8%	+15.8%
Places Visited			
Only Bar Harbor	40.7%	+1.1%	+10.2%
Bar Harbor and Bangor	16.6%	+0.9%	+9.4%
Travel mode			
Driving without a trailer	65.8%	+1.3%	-19.6%
Drive with a trailer	9.6%	-0.2%	-4.5%
Fly	18.4%	+1.4%	+10.4%